



**Carl Pomerance**  
 Dartmouth College

Conférences dans le cadre de l'atelier "Nouvelles approches en théorie probabiliste et multiplicative des nombres"  
 (8-12 décembre 2014)  
 Lectures at the Workshop on New approaches in probabilistic and multiplicative number theory  
 (December 8-12, 2014)

**Lundi 8 décembre 2014, 9h30 / Monday, December 8, 2014, 9:30 am**

**"The ranges of some familiar functions"**

Consider those integers which appear as values of  $s(n)$ , of  $f(n)$ , or of  $l(n)$ . Here  $s$  is the sum-of-divisors function,  $f$  is Euler's function (returning the order of  $(\mathbf{Z}/n\mathbf{Z})^\times$ ), and  $l$  is the Gauss–Carmichael function (returning the exponent of  $(\mathbf{Z}/n\mathbf{Z})^\times$ ). That most numbers are never values of these functions is not immediately obvious (especially so for  $l$ ). Studying the problem for  $f$  80 years ago, Erdős was led to discover the normal number of prime factors of a shifted prime. This talk will survey the subject and discuss some very new results.

**Vendredi 12 décembre 2014, 9h30 / Friday, December 12, 2014, 9:30 am**

**"Amicable numbers"**

The concept goes back to Pythagoras: two numbers form an amicable pair if the sum of the proper divisors of one is the other, and vice versa. The study of the distribution of such numbers is more recent, going back about 60 years. In this lecture I will report on some very recent results on amicable numbers and related topics.

**CRM, Pavillon André-Aisenstadt Université de Montréal**

**Salle / Room 6214**

**Conférence s'adressant à un large auditoire**

**Lecture suitable for a general audience**

**Jeudi 11 décembre 2014, 16h00 / Thursday, December 11, 2014, 4:00 pm**

**"The first function"**

Let  $s(n)$  denote the sum of the positive divisors of  $n$  that are smaller than  $n$ . Introduced by Pythagoras 2500 years ago, it is perhaps the first function ever studied in mathematics. Steeped in numerology and colorful metaphors, the ancient problems associated with  $s(n)$  have led to much of number theory, including some very recent results.

**Pavillon Claire-McNicoll, Université de Montréal**

**Salle / Room Z-220**

Une réception suivra la conférence au Salon Maurice-L'Abbé, Pavillon André-Aisenstadt (Salle 6245).  
 A reception will follow at the Salon Maurice-L'Abbé, Pavillon André-Aisenstadt (Room 6245).

